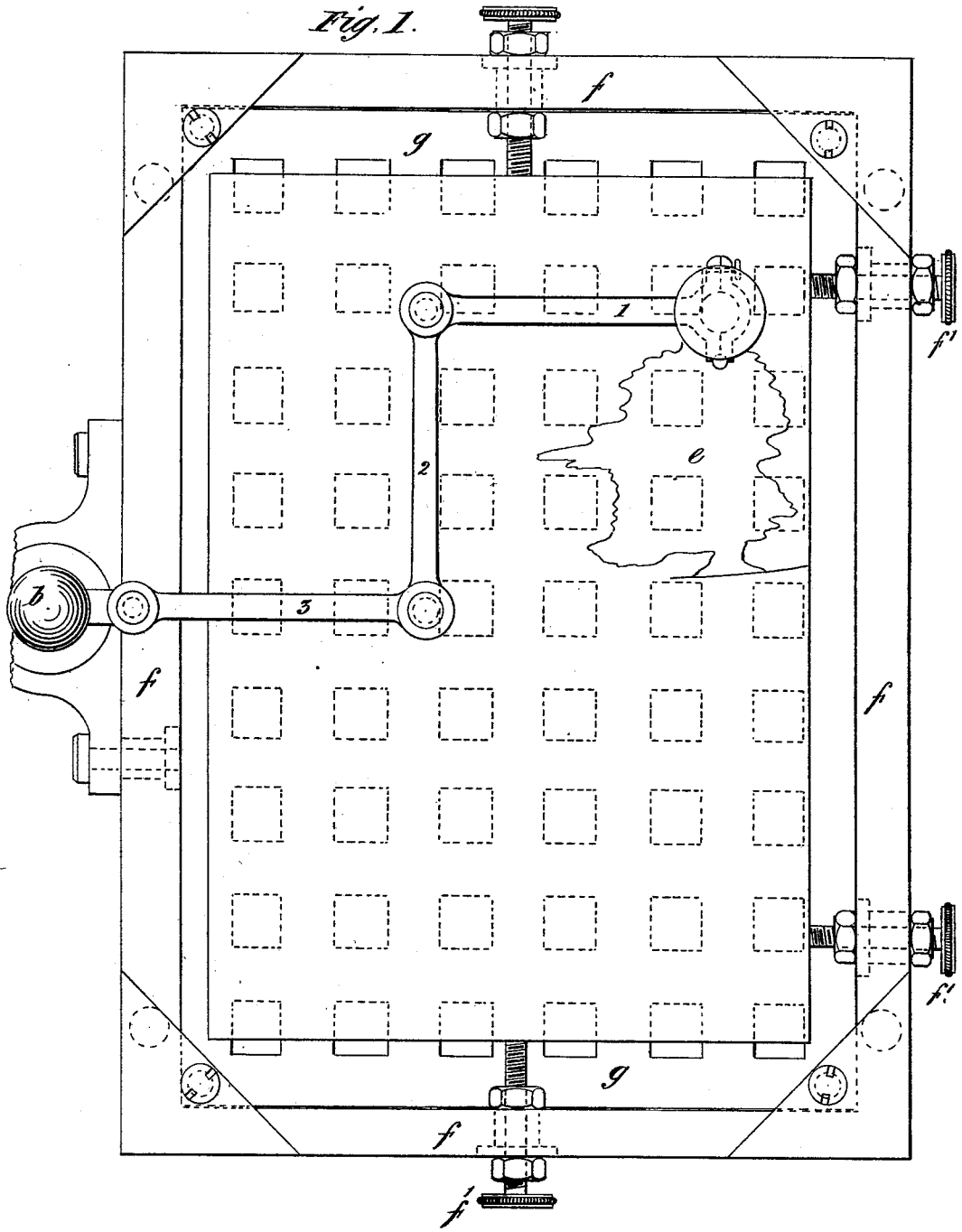
2 Sheets—Sheet 1.

C. H. O. RADDE.

MACHINE FOR SHAPING SOLID COLORS FOR PRINTING.

No. 189,654. Patented April 17, 1877.

Fig. 1.



Witnesses.
Pennington Halsted
Chas. E. Hall.

Inventor
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by John J. Halsted.

2 Sheets—Sheet 2.

C. H. O. RADDE.

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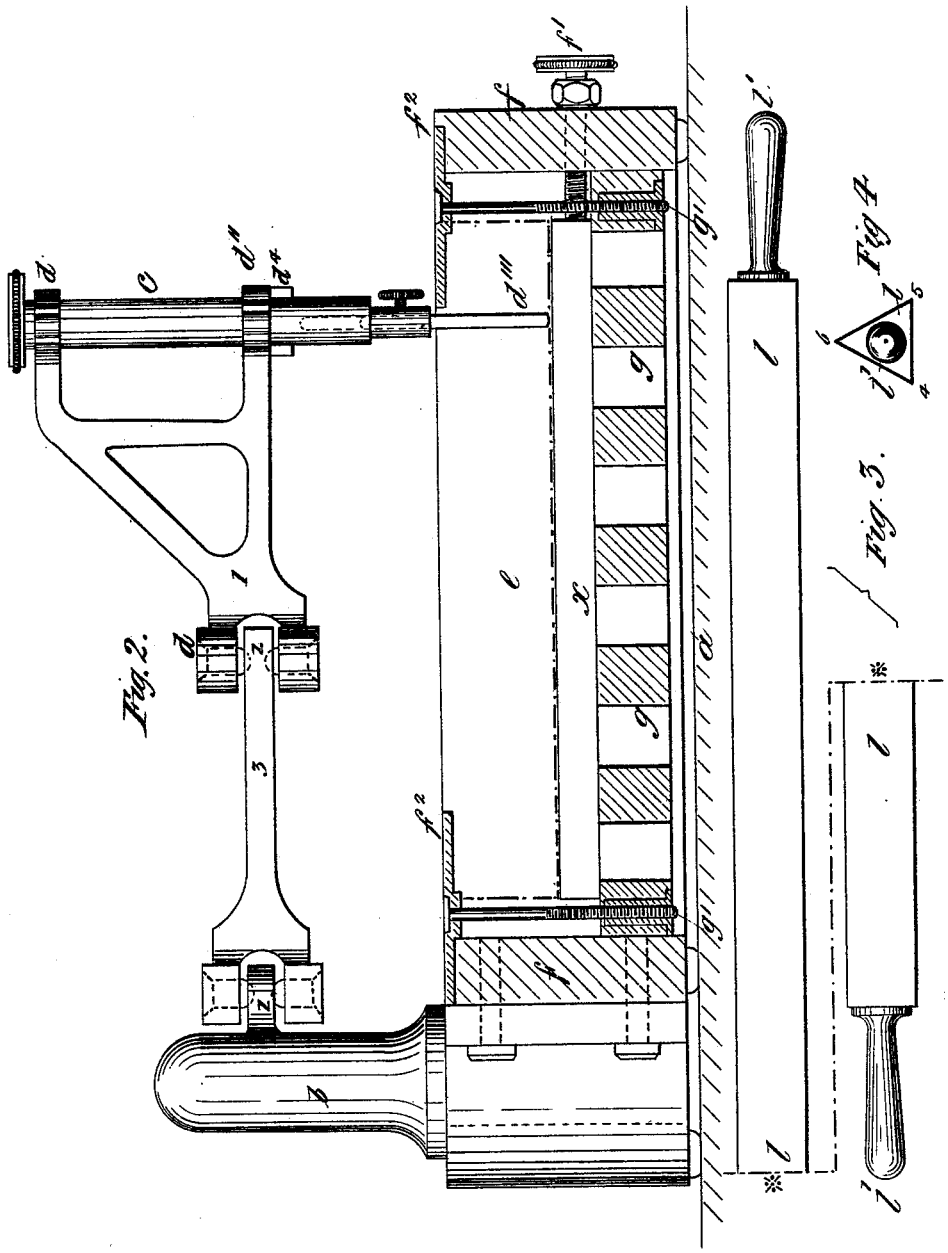

Fig. 2.

Fig. 4.

Fig. 3.

Witnesses.
Remington & Halsted
Chas. R. Bell.

Inventor.
Carl Heinrich Otto Radde
by John J. Halsted
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UNITED STATES PATENT OFFICE.

CARL H. O. RADDE, OF HAMBURG, GERMANY.

IMPROVEMENT IN MACHINES FOR SHAPING SOLID COLORS FOR PRINTING.

Specification forming part of Letters Patent No. **189,654**, dated April 17, 1877; application filed January 17, 1877.

To all whom it may concern:

Be it known that I, CARL HEINRICH OTTO RADDE, of Hamburg, in the Empire of Germany, merchant, have invented a new and useful Improved Machine for Shaping Solid Colors for Printing, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of the invention is to facilitate the reproduction, in quantity, of copies of pictures or representations having varieties of colors or tints, the colors having been severally mixed with suitable composition that will enable each to be cut, molded, or shaped to any desired form, such as the ultimate pattern may demand; and these forms being then grouped and united together, as hereinafter described, into such relation with each other, in a suitable frame or holder, as, when so combined or grouped, to form on the surface, as well as through the mass of composition, from its top to bottom, a picture or representation, and from which, by the aid of a suitable press and appliances, copies may be readily obtained upon paper, or other suitable fabric or material prepared to receive such impressions.

The coloring matter I employ is prepared so as to be of a comparatively solid consistency when cold, and to be readily reducible to a fluid state by heat—such, for instance, as that described in my Patent No. 186,163, dated January 9, 1877.

The heat I employ is that of a jet or jets of gas; but other clean heat may be employed.

The various colors, tints, or shades of this printing composition necessary to form the variegated representation are severally brought into close juxtaposition with each other, so as, when combined, to produce the representation, and this aggregated body of parti-colored matter is to be of one uniform thickness, the pattern extending all through such thickness.

The respective portions of colored matter are collected in a frame in form adapted to the result desired, and of depth corresponding with the thickness of the required combined mass, and I proceed as follows:

Supposing the ground or body of the picture to be black, I proceed to fill in this frame with the black color to a convenient extent, aided by other temporary inclosing-strips or border-pieces. I then leave that portion to solidify, and then, having traced thereon the outline of the picture, or portion of picture bordering on such black portion or portions of the groundwork, I, by means of a sharp knife, or other suitable instrument, cut away the black color to such outline in vertical direction that its form may be uniform throughout its thickness—that is, from top to bottom. I then apply another temporary wall or boundary-plate at a distance near the color so last applied, and cut to shape and corresponding with the extent of color to be used next such ground, and I fill into the space now formed some composition of the color or tint desired in a fluid state, as before, and allow that to solidify, when I remove therefrom the temporary boundary, and by the cutter, as before, reduce such coloring matter to the extent desired, and so on with every color, tint, or shade, step by step, until the whole desired representation, with its border, is obtained in the frame, when there will be formed, not only on the surface, but at every portion of the thickness of the mass, a corresponding representation.

Apparatus such as I employ is represented by plan and end views at Figures 1 and 2.

As shown, the table *a* is of marble, made true on its upper surface. *f* is the wooden frame. *e* represents the picture being produced in the bottom board or granite or other plate in this frame, the bottom board or granite plate *x* being shown in section in Fig. 2, and in plan in Fig. 1, where it will also be seen that its horizontal movement is controlled by screws f^1 and nuts applied through the sides of the frame *f*. *b* is the support of the jointed links or part arms 1 2 3 of the frame *d*, with its clamp d' d'', and the knife or cutter d''' carried thereby. The knife or cutter d''' while capable of moving horizontally, is also capable of working vertically, so as to move up and down in the two holders or clamps d' d''. The lower of these clamps d'' rests upon a little projection, d^4, fastened on

the shaft of the knife, and which serves as an additional support for securing its more exact horizontal movement.

The frame *f*, and parts thereof brought into contact with the fluid composition of coloring matters, I form of wood, and I generally use pear-tree for the purpose, saturated by boiling in glycerine.

The depth or thickness of coloring matter at any time produced may be varied. To facilitate this operation a suitable wooden frame, *f*, is employed. Into this frame *f* I place grate-work *g*, either of wood or cast-iron; and the grate *g* itself is capable of sliding up and down, according to convenience, regulated by means of screws *g'*, carrying with it a granite or other suitable slab or board, *x*, which it supports. This granite or other suitable board *x* is fastened to the grate *g*, with capability of regulation, by temporary screws *f*[1], passing through the sides of the frame *f* to the edges of the board *x*, and is the bottom support, upon which the color is poured or cast.

The surface of the bottom board or granite or other plate *x* should be oiled and varnished with copal varnish before the color is poured or placed on it.

It is important that all the different portions of coloring matter employed be of the same density, as nearly as possible, in order to insure that the same amount of coloring matter be taken by the paper or other material printed with each impression from all the colors forming the printing-surface for the time employed.

The knife or cutting-instrument, *d'''*, I employ for obtaining the correct outlines of the respective portions of coloring matter is applied to a holder, *c*, which is held in clamps *d' d''*, affixed to, or formed on, the ends of one of three links or joints, 1 2 3, jointed together, with capability of freely moving on strong steel points *z* in steel linings. The last or hindmost of these combined links, 3, is fastened to a strong vertical shaft, *b*, fastened in the middle of the back of the wooden frame *f* or other suitable position. The first or foremost of the links or jointed parts, 1, as shown, ends in two holders or noses, *d' d''*, which, when opened, receive the shaft or holder *c* and cutter or knife *d'''*, and, when closed, still admit of its freely moving not only in various directions to follow horizontally the course of the form for the time to be obtained, but also vertically to the depth desired; and in some cases the cutter for the time employed may itself be so shaped as to take the form or contour of the cutting desired to be produced, such shaped cutter having a piston or clearer, to clear itself after each cutting.

The holders or shafts *c*, as well as the knives or cutters *d'''*, are readily changeable, as required; and to insure their correct vertical action, they are provided with spirit or other liquid levels.

The upper edge f^2 of the upper portion of the frame *f* is plated with metal, to sustain the horizontal cutter or leveler *l*, hereinafter described.

It is desirable, as the respective masses of colored matter are accumulated, to level the upper surface of them, to facilitate the obtaining of correct outlines of the parts to be cut for the next portions of composition.

For this purpose I find it convenient to use a bar, *l*, (shown by plan view, Fig. 3, and end view, Fig. 4,) the section of which is prismatic or triangular, as thereby three cutting-edges, 4 5 6, are obtained, either of which may be used; and this cutter-bar *l* is moved to and fro on the upper edge f^2 of the frame *f* and on the coloring matter, to reduce such coloring matter to a uniform or level surface.

The prismatic or triangular bar is provided with a handle, *t'*, at each end thereof, for facility of operation.

To insure correct outlines of the various parts being obtained I employ a transparent medium adapted to receive and retain slight indentations, produced, as desired, by a fine-pointed instrument. I fill these indentations with powdered charcoal or other suitable matter; and then, by turning over such surface of this transparent medium upon the coloring matter in the frame, and pressing gently the back of the part last traced, the powder or other suitable matter will be laid onto the coloring matter, to serve as a guide for the cutting of it.

The transparent medium I employ for this purpose is composed of thick collodion, with ricinus oil, in the proportion of twenty parts of the former to one of the latter, or thereabout, reduced to the required thickness by being laid on a glass plate.

This medium is, in use, held in a frame which is at once capable of fitting both the frame holding the original and that containing the colors being combined for the printing of copies.

When the picture is completed upon the granite or other suitable slab or board, a thin wooden frame, of exactly the dimensions of the granite slab or board, and sufficiently high to protect the entire thickness of the colored mass, is placed over the block or cake, and in this state it is removed to the press.

Having thus described my invention, I claim—

1. In a machine for shaping and cutting to shape a printing material composed of aggregated parti-colors, representing a predetermined pattern, the combination, with a knife-supporting mechanism, of a slab for supporting the color composition, and adjusting devices, substantially as described, for regulat-

ing the position of such slab and the grate upon which it rests, all as shown and set forth.

2. In combination with the frame and slab adapted for holding the color composition, a knife-supporting mechanism, substantially as described, having capacity for a universal movement horizontally, and carrying a knife or cutter for trimming the composition, the combination being substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL HEINRICH OTTO RADDE.

Witnesses:

PAUL MÖLLER,

H. SCHRADER.